

REMARKS

In the Office Action dated July 15, 2002, the Examiner (1) objected to claims 44 and 48; and (2) rejected claims 44-53 under 35 USC §103(a) as being unpatentable over *Schumacher* (U.S. Patent No. 4,657,093) in view of United Kingdom Patent 2,279,095 (GB 2,279,095). Applicant respectfully traverses these rejections for the following reasons.

Status of the Claims

Claims 44 and 48 have been objected to and claims 44-53 have been rejected.

Claim 44 has been amended.

Claims 44-53 remain pending.

Claim Objections

The Examiner objected to claims 44 and 48 because of a few informalities. In a phone conversation with Examiner Petravick on October 9, 2002, it was discovered that the clean copy of the claims and the marked-up copy of the claims in the Preliminary Amendment dated December 11, 2001 differed from each other. It was agreed upon to use the clean copy of the claims in combination with the claim objections. In response, Applicant has amended claim 44 to comply with the Examiner's recommendations and therefore requests that the Examiner reconsider and withdraw the objections of claims 44 and 48.

§103 Rejections

The Examiner rejected all pending claims under 35 U.S.C. § 103(a) as being unpatentable over *Schumacher* in view of GB 2,279,095. Applicant respectfully traverses the Examiner's rejection and request that the Examiner reconsider and withdraw the rejections.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2143.

Schumacher teaches a roller cone bit wherein the rotational axes of the roller cones are offset from the rotational axis of the drill bit. As is typical in the prior art, the roller cones are equipped with inserts made from a hardened material to aid in formation cutting. *Schumacher*

teaches that the offset of the rotational axes of the roller cones increases drilling efficiency and also increases wear in the hardened inserts. *Schumacher* discloses that the drill bits are most suitable for *soft to medium-soft formations* and employ tungsten carbide inserts in the drill bits. (col. 3, ll. 22-25) *Schumacher* suggests that the increased offset will increase wear in the inserts but should be offset by increased penetration rates.

GB 2,279,095 teaches the use of a circumferential row of extended inserts on the heel of a roller cone. GB 2,279,095 teaches that the inserts preferably have a diamond cutting-surface. The inserts protrude from the cone to the bore diameter in order to maintain the gage diameter of the borehole. GB 2,279,095 also suggests the use of multiple, concentric rows of inserts at different diameters from the cone center, but still located on the heel of the cone, where the inner row has inserts of a different height than the inserts of the outer row.

In reference to claim 44, neither reference contains motivation to combine the offset cones of *Schumacher* with the ultra-hard inserts disclosed in GB 2,279,095. *Schumacher* teaches that the offsetting of the cones results in increased wear on the inserts but does not suggest that increasing the abrasive qualities of the inserts will improve the performance of the bit. Similarly, there are no references in GB 2,279,095 that suggest that the use of the inserts described in offset cone bits is advantageous. The teachings to combine the references and the reasonable expectation of success must be found in the prior art. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991); MPEP 2143. According to the Federal Circuit, "[t]he level of skill in the art cannot be relied upon to provide the suggestion to combine references." *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308 (Fed. Cir. 1999); *see also* MPEP 2143.01. Because there is no suggestion to combine found in either *Schumacher* or GB 2,279,095, the combination of references does not establish a *prima facie* case of obviousness.

Additionally, in reference to claim 44, the combination of *Schumacher* with GB 2,279,095 does not teach or suggest all the claim limitations; *Schumacher* fails to teach a medium-hard to extremely hard formation-type earth boring bit. Rather, as discussed above, *Schumacher's* bits are intended for use in "soft to medium-soft formations." As indicated in the attached affidavit of Michael Siracki, the bits disclosed by *Schumacher* are not for use in hard formations. It should be recognized that the language in a preamble can limit the invention as a whole if it is necessary to give meaning to the claim in order to properly define the invention. *See Perkin-Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 896, 221 U.S.P.Q. 669, 675-76 (Fed. Cir. 1984). Because the combination of *Schumacher* with GB 2,279,095 fail to teach or suggest all of the claim limitations, the combination of references does not establish a *prima facie* case of obviousness.

Claims 45-53 are dependent on claim 44. If an independent claim is non-obvious, then any claims that depend therefrom are also non-obvious. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1998); MPEP 2143.03. The Applicant asserts that because claim 44 is in condition for allowance then the balance of the non-withdrawn claims are also in condition for allowance.

Alternatively, if one of the independent claims is found to be not in condition for allowance then the obviousness analysis as described above must be applied to each claim. The arguments presented in opposition to establishing a *prima facie* case of obviousness, as set forth above, are also applicable for each of the dependent claims. Additionally, the Applicant would like to point out a difference between the prior art and the present invention as claimed in a dependent claim.

In reference to claim 48, the ranges claimed fall into the range explicitly taught away from by *Schumacher*. The above mentioned claim is given only as an example and is not the only dependent claim that possesses claim elements distinct from the cited prior art.

Conclusion

For all of the foregoing reasons, Applicant submits that the claims are in condition for allowance and Applicant therefore requests that the Examiner enter the present amendments and allow the case. If the Examiner has any questions or comments or otherwise feels it would be helpful, he is encouraged to telephone the undersigned at (713) 238-8000.

Respectfully submitted,



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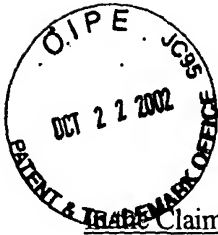
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Version with Markings to Show Changes Made

Trade Claims:

44. (Twice Amended) A medium-hard to extremely hard formation-type earth boring bit comprising:

- a) a bit body having a longitudinal bit axis and a bit diameter;
- b) at least one rolling cone cutter rotatably mounted on the bit body and having an offset of its rotational axis from the bit axis of:

[1] i) at least 1/16 inches when the bit diameter is less than 7 inches,

[2] ii) at least 3/32 inches when the bit diameter is at least 7 inches and less than 12 inches,

[3] iii) at least 5/32 inches when the bit diameter is at least 12 inches; and

- c) a journal angle being formed between the rotational axis and the bit axis of at least 36°;

[a] d) at least one super-abrasive cutter element located on an inner row of the cone cutter.

45. The bit of claim 44 wherein the super-abrasive cutter element comprises a polycrystalline diamond coated insert.

46. The bit of claim 44 wherein the super-abrasive cutter element comprises a cubic boron nitride coated insert.

47. The bit of claim 44 wherein the amount of offset is:

- a) at least 3/32 inches and less than 1/8 inches when the bit diameter is less than 7 inches,
- b) at least 5/32 inches and less than 7/32 inches when the bit diameter is at least 7 inches and less than 12 inches, and
- c) at least 7/32 inches and less than 9/32 inches when the bit diameter is at least 12 inches.

48. The bit of claim 44 wherein the amount of offset is:

- a) at least 1/8 inches when the bit diameter is less than 7 inches,
- b) at least 7/32 inches when the bit diameter is at least 7 inches and less than 12 inches, and

c) at least 9/32 inches when the bit diameter is at least 12 inches.

49. The bit of claim 44 wherein the bit comprises an insert bit having an IADC classification of 6-1-x or higher series number.

50. The bit of claim 44 further comprising a super-abrasive cutter element located on a gage row of the rolling cone cutter.

51. The bit of claim 44 further comprising a super-abrasive cutter element located on a secondary gage row of the rolling cone cutter.

52. The bit of claim 44 further comprising a super-abrasive cutter element located on a heel row of the rolling cone cutter.

53. The bit of claim 44 further comprising super-abrasive cutter elements located on all the inner rows of all the rolling cone cutters.